CLASS 10 · MATHEMATICS · CHAPTER 7

Coordinate Geometry - Exercise 7.2

Exercise 7.2 with independently verified solutions.

CHAPTER	RESOURCE	SOURCE
Coordinate Geometry	NCERT Exercises	NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

QUESTION

Question 1

section formula · internal division

Find the coordinates of the point which divides the line segment joining A(-1, 7) and B(4, -3) internally in the ratio 2 : 3.

Solution

Board-exam working:

Using the section formula for the ratio 2 : 3:

$$P = \left(\frac{2(4) + 3(-1)}{2 + 3}, \frac{2(-3) + 3(7)}{2 + 3} \right)$$

Calculate the x-coordinate:

$$x = \frac{8 - 3}{5} = \frac{5}{5} = 1$$

Calculate the y-coordinate:

$$y = \frac{-6 + 21}{5} = \frac{15}{5} = 3$$

Final answer

The required point is (1, 3).

QUESTION

Question 2

section formula · trisection

Find the coordinates of the points of trisection of the line segment joining A(4, -1) and B(-2, -3).

Solution

Board-exam working:

Let P and Q be the trisection points, so AP = PQ = QB.

Point P divides AB internally in the ratio 1 : 2.

$$P = \left(\frac{1(-2)+2(4)}{1+2}, \frac{1(-3)+2(-1)}{1+2}\right)$$

$$P = \left(\frac{-2+8}{3}, \frac{-3-2}{3}\right) = \left(2, -\frac{5}{3}\right)$$

Point Q divides AB internally in the ratio 2 : 1.

$$Q = \left(\frac{2(-2)+1(4)}{2+1}, \frac{2(-3)+1(-1)}{2+1}\right)$$

$$Q = \left(\frac{-4+4}{3}, \frac{-6-1}{3}\right) = \left(0, -\frac{7}{3}\right)$$

Final answer

The trisection points are:

$$\left(2, -\frac{5}{3}\right) \quad \text{and} \quad \left(0, -\frac{7}{3}\right)$$

QUESTION

Question 3

section formula · distance formula · midpoint · sports day

In the rectangular school ground shown in Figure 7.12, 100 flower pots are placed 1 m apart along AD. Niharika runs one-fourth of AD on the second line and places a green flag. Preet runs one-fifth of AD on the eighth line and places a red flag. Find the distance between the flags and the point where Rashmi should place a blue flag halfway between them.

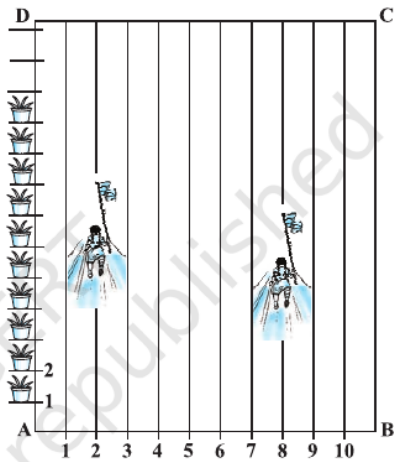


Fig. 7.12

Figure 7-12 from the supplied NCERT chapter.

Solution

Board-exam working:

Take A as the origin, the running-line number as the x-coordinate, and the distance along AD as the y-coordinate.

Niharika is on the second line and covers one-fourth of 100 m:

$$\frac{1}{4} \times 100 = 25 \text{ m}$$

Therefore, the green flag is at G(2, 25).

Preet is on the eighth line and covers one-fifth of 100 m:

$$\frac{1}{5} \times 100 = 20 \text{ m}$$

Therefore, the red flag is at R(8, 20).

Distance between the flags:

$$GR = \sqrt{(8-2)^2 + (20-25)^2}$$

$$GR = \sqrt{6^2 + (-5)^2} = \sqrt{36 + 25} = \sqrt{61} \text{ m}$$

Rashmi must place the blue flag at the midpoint of G and R:

$$M = \left(\frac{2+8}{2}, \frac{25+20}{2} \right)$$

$$M = \left(5, \frac{45}{2} \right) = (5, 22.5)$$

Final answer

The flags are √61 m apart. Rashmi should place the blue flag on the fifth line, 22.5 m from A along AD.

QUESTION

Question 4

section formula · ratio of division

Find the ratio in which P(-1, 6) divides the line segment joining A(-3, 10) and B(6, -8).

Solution

Board-exam working:

Let P divide AB internally in the ratio m : n.

Using the x-coordinate in the section formula:

$$-1 = \frac{6m - 3n}{m + n}$$

Cross multiplying:

$$-m - n = 6m - 3n$$

$$2n = 7m$$

$$\frac{m}{n} = \frac{2}{7}$$

$$m : n = 2 : 7$$

Verification using the y-coordinate:

$$y = \frac{2(-8) + 7(10)}{2 + 7} = \frac{-16 + 70}{9} = 6$$

Final answer

P divides AB internally in the ratio 2 : 7.

QUESTION

Question 5

section formula · x-axis · ratio of division

Find the ratio in which the x-axis divides the line segment joining A(1, -5) and B(-4, 5). Also find the point of division.

Solution

Board-exam working:

Let the x-axis meet AB at P and let AP : PB = m : n.

Since P lies on the x-axis, its y-coordinate is 0.

$$0 = \frac{m(5) + n(-5)}{m + n}$$

$$5m - 5n = 0$$

$$m = n$$

$$m : n = 1 : 1$$

Thus P is the midpoint of AB.

$$P = \left(\frac{1 + (-4)}{2}, \frac{-5 + 5}{2}\right)$$

$$P = \left(-\frac{3}{2}, 0\right)$$

Final answer

The ratio is $1:1$, and the point of division is:

$$\left(-\frac{3}{2}, 0\right)$$

QUESTION

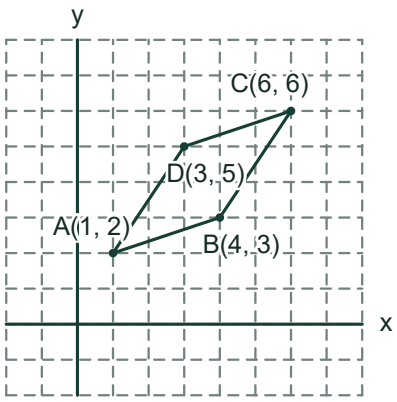
Question 6

midpoint formula · parallelogram · diagonals

If A(1, 2), B(4, y), C(x, 6) and D(3, 5) are the vertices of a parallelogram in order, find x and y.

Solution

Board-exam working:



Parallelogram with the solved coordinates — solution sketch (not to scale).

The diagonals of a parallelogram bisect each other. Therefore, the midpoint of AC equals the midpoint of BD.

Midpoint of AC:

$$\left(\frac{1+x}{2}, \frac{2+6}{2}\right) = \left(\frac{1+x}{2}, 4\right)$$

Midpoint of BD:

$$\left(\frac{4+3}{2}, \frac{y+5}{2}\right) = \left(\frac{7}{2}, \frac{y+5}{2}\right)$$

Equating x-coordinates:

$$\frac{1+x}{2} = \frac{7}{2}$$

$$1+x = 7$$

$$x = 6$$

Equating y-coordinates:

$$4 = \frac{y+5}{2}$$

$$8 = y+5$$

$$y = 3$$

Final answer

x = 6 and y = 3.

QUESTION

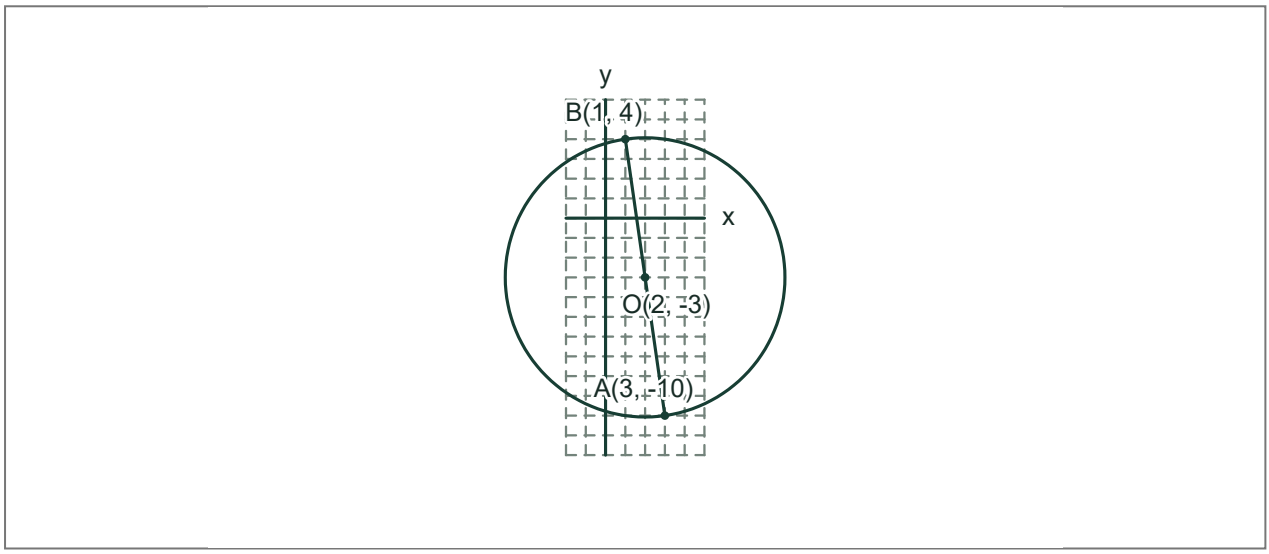
Question 7

midpoint formula · diameter · circle

Find the coordinates of A if AB is a diameter of a circle whose centre is O(2, -3) and B is (1, 4).

Solution

Board-exam working:



Centre is the midpoint of a diameter — solution sketch (not to scale).

Let A = (x, y). Since O is the centre of the circle, O is the midpoint of diameter AB.

Using the midpoint formula:

$$\left(\frac{x+1}{2}, \frac{y+4}{2}\right) = (2, -3)$$

Equating x-coordinates:

$$\frac{x+1}{2} = 2$$

$$x + 1 = 4$$

$$x = 3$$

Equating y-coordinates:

$$\frac{y+4}{2} = -3$$

$$y + 4 = -6$$

$$y = -10$$

Final answer

A = (3, -10).

QUESTION

Question 8

section formula · fraction of a segment

A and B are (-2, -2) and (2, -4). Find P on AB such that:

$$AP = \frac{3}{7}AB$$

Solution

Board-exam working:

Since AP is three-sevenths of AB, the remaining part PB is four-sevenths of AB.

$$AP : PB = 3 : 4$$

Using the section formula:

$$P = \left(\frac{3(2)+4(-2)}{3+4}, \frac{3(-4)+4(-2)}{3+4}\right)$$

Calculate the x-coordinate:

$$x = \frac{6-8}{7} = -\frac{2}{7}$$

Calculate the y-coordinate:

$$y = \frac{-12-8}{7} = -\frac{20}{7}$$

Final answer

$$P = \left(-\frac{2}{7}, -\frac{20}{7}\right)$$

QUESTION

Question 9

section formula · four equal parts

Find the coordinates of the three points which divide the line segment joining A(-2, 2) and B(2, 8) into four equal parts.

Solution

Board-exam working:

Let P, Q and R divide AB into four equal parts in that order.

Point P divides AB in the ratio 1 : 3.

$$P = \left(\frac{1(2)+3(-2)}{4}, \frac{1(8)+3(2)}{4}\right)$$

$$P = \left(-1, \frac{7}{2}\right)$$

Point Q is the midpoint and divides AB in the ratio 1 : 1.

$$Q = \left(\frac{-2+2}{2}, \frac{2+8}{2}\right) = (0, 5)$$

Point R divides AB in the ratio 3 : 1.

$$R = \left(\frac{3(2)+1(-2)}{4}, \frac{3(8)+1(2)}{4}\right)$$

$$R = \left(1, \frac{13}{2}\right)$$

Final answer

The three points are:

$$\left(-1, \frac{7}{2}\right), \quad (0, 5), \quad \left(1, \frac{13}{2}\right)$$

QUESTION

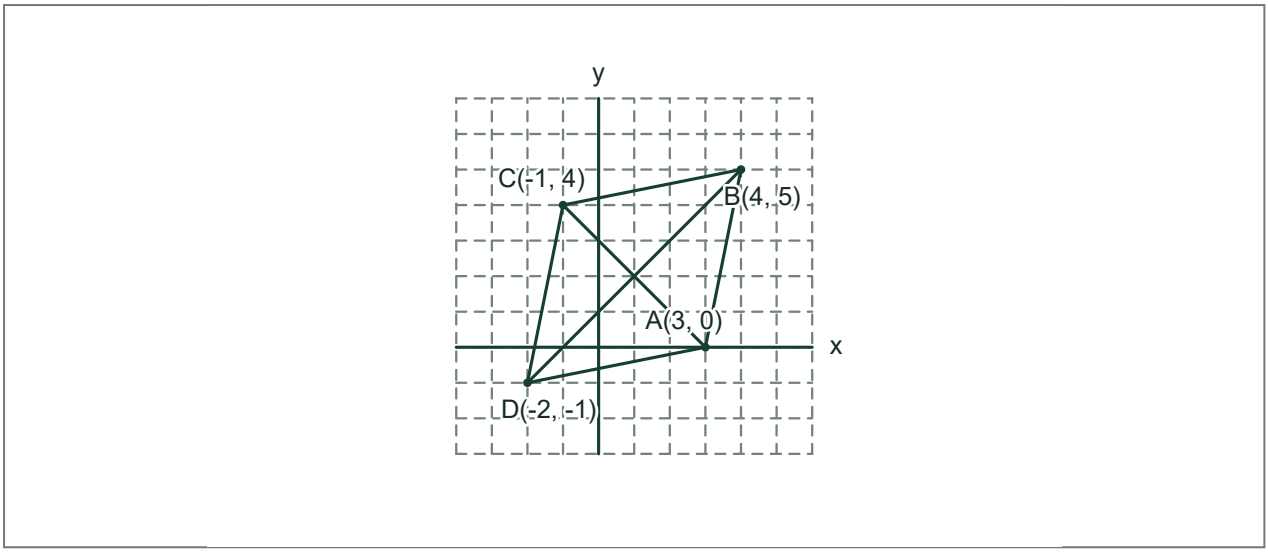
Question 10

distance formula · rhombus · area

Find the area of the rhombus whose vertices, in order, are A(3, 0), B(4, 5), C(-1, 4) and D(-2, -1).

Solution

Board-exam working:



Rhombus and its perpendicular diagonals — solution sketch (not to scale).

The diagonals are AC and BD.

Length of AC:

$$AC = \sqrt{(-1-3)^2 + (4-0)^2}$$

$$AC = \sqrt{(-4)^2 + 4^2} = \sqrt{32} = 4\sqrt{2}$$

Length of BD:

$$BD = \sqrt{(-2-4)^2 + (-1-5)^2}$$

$$BD = \sqrt{(-6)^2 + (-6)^2} = \sqrt{72} = 6\sqrt{2}$$

Area of a rhombus:

$$\text{Area} = \frac{1}{2} \times d_1 \times d_2$$

$$\text{Area} = \frac{1}{2} \times 4\sqrt{2} \times 6\sqrt{2}$$

$$\text{Area} = \frac{1}{2} \times 24 \times 2 = 24 \text{ square units}$$

Final answer

The area of the rhombus is 24 square units.